AF

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Patent Application

Applicant(s):	Bagga et al.
Case:	1-1-1-1-1-1-1-1-3-1
Serial No.:	09/520,133
Filing Date:	March 7, 2000
Group:	2143
Examiner:	Alina N. Boutah

I hereby certify that this paper is being deposited on this date with the U.S. Postal Service as first class mail addressed to the Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

Signature: Teresa M. Hoard Date: March 21, 2005

Title: Inter-Domain Network Management System For Multi-Layer Networks

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TRANSMITTAL OF APPEAL BRIEF

Mail Stop Appeal Brief - Patents
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

Submitted herewith are the following documents relating to the above-identified patent application:

(1) Appeal Brief; and
(2) Copy of Notice of Appeal, filed on December 14, 2004, with copy of stamped return postcard indicating receipt of Notice by PTO on December 20, 2004.

Please extend the period for response by one month to March 20, 2005. Please charge **Ryan, Mason & Lewis, LLP Account No. 50-0762** the amount of $620 ($500 to cover this submission under 37 CFR §1.17(c) and $120 to cover the one month extension fee). In the event of non-payment or improper payment of a required fee, the Commissioner is authorized to charge or to credit **Deposit Account No. 50-0762** as required to correct the error. A duplicate copy of this letter is enclosed.

Respectfully submitted,

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Date: March 21, 2005

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Signature: Teresa M. Hamlin Date: March 21, 2005

Title: Inter-Domain Network Management System For Multi-Layer Networks

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APPEAL BRIEF

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

Applicants hereby appeal the final rejection dated September 14, 2004, of claims 1-19 of the above-identified application.

REAL PARTY IN INTEREST

The present application is assigned to Lucent Technologies Inc., as evidenced by an assignment recorded July 14, 2000 in the U.S. Patent and Trademark Office at Reel 010924, Frame 0344. The assignee Lucent Technologies Inc. is the real party in interest.

RELATED APPEALS AND INTERFERENCES

There are no known related appeals or interferences.

STATUS OF CLAIMS

The present application was filed on March 7, 2000, with claims 1-19, and claims the priority of a provisional application filed July 30, 1999. Claims 1-19 are currently pending in the present application. Claims 1, 18 and 19 are the independent claims.

Each of claims 1-19 stands finally rejected under 35 U.S.C. §103(a). Claims 1-19 are appealed.

STATUS OF AMENDMENTS

There have been no amendments filed subsequent to the final rejection.

SUMMARY OF CLAIMED SUBJECT MATTER

Independent claims 1, 18 and 19 are directed to a network management system, a method of implementing a network management system, and a machine-readable medium storing one or more software programs for use in implementing a network management system, respectively. In each of the claims, the network management system comprises an inter-domain configuration manager arranged between a set of one or more network service management applications and a plurality of network element domain managers, with each of the domain managers being associated with a particular architectural or technological domain of a multi-layer network. The inter-domain configuration manager implements network service design and provisioning functions across a plurality of the domains of the network in conjunction with stored connectivity information characterizing the multi-layer network. The claims further specify that the inter-domain configuration manager comprises an inter-domain tree manager, with the inter-domain tree manager comprising a logical tree manager. The logical tree manager is operative to manage a transport service and facility hierarchy associated with the multi-layer network, and to maintain corresponding parent-child relationships in one or more tree structures that reference the domains containing real-time network details associated with the transport service and facility hierarchy.

An illustrative embodiment of the invention is shown in FIG. 2 of the drawings and includes inter-domain configuration manager 210, arranged between a set of service management layer applications 250, and a set of domain management systems 240. The inter-domain configuration

manager 210 comprises an inter-domain tree manager 212, which in turn comprises a logical tree manager that interfaces with a connectivity database 290.

As shown in FIG. 8, the logical tree manager 310 is coupled to connectivity database 290 and to a view manager 312 of the inter-domain tree manager 212. The logical tree manager 310 is responsible for managing an end-to-end transport service and facility hierarchy, and it performs this function at least in part by maintaining parent-child relationships in a tree structure that references the domains that contain the real-time network details. See the specification at page 7, line 9, to page 8, line 20. FIG. 5 shows a particular example of a tree structure maintained using logical tree manager 310 for a given end-to-end transport service. This exemplary tree structure is maintained for a DS1 message trunk provisioned in the multi-layer network 400 of FIG. 4. See the specification at page 8, line 24, to page 9, line 17.

The illustrative embodiment provides a number of advantages over conventional network management systems. For example, this embodiment allows service providers in the telecommunications industry to achieve quick introduction of new services, expedited service implementation, prompt fault resolution, and service capacity management capabilities not available in prior art multi-layer network environments.

GROUND OF REJECTION TO BE REVIEWED ON APPEAL

Claims 1-19 stand rejected under 35 U.S.C. §103(a) as being unpatentable over M. Mortensen, "Operations Architecture for Data-Centric Converged Telecommunications Networks: Lucent Technologies' Open Operations CORBA Architecture," Lucent Network and Services Management White Paper, pp. 1-10, 1999 (hereinafter "the Mortensen reference"), in view of U.S. Patent No. 6,289,201 (hereinafter "Weber").

ARGUMENT

Claims 1-7 and 11-19

A proper *prima facie* case of obviousness requires that the cited references when combined must "teach or suggest all the claim limitations," and that there be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill

in the art, to combine the references or to modify the reference teachings. See Manual of Patent Examining Procedure (MPEP), Eighth Edition, August 2001, §706.02(j).

Applicants submit that the Examiner has failed to establish a proper *prima facie* case of obviousness in the present §103(a) rejection, in that the Mortensen and Weber references, even if assumed to be combinable, fail to teach or suggest all the claim limitations, and in that no cogent motivation has been identified for combining the references or for modifying the reference teachings to reach the claimed invention. Further, even if it is assumed that a proper *prima facie* case has been established, there are particular teachings in one or more of the references which controvert the obviousness argument put forth by the Examiner.

As indicated above, independent claim 1 is directed to a network management system comprising an inter-domain configuration manager arranged between a set of one or more network service management applications and a plurality of network element domain managers, each of the domain managers being associated with a particular architectural or technological domain of a multi-layer network, the configuration manager implementing network service design and provisioning functions across a plurality of the domains of the network in conjunction with stored connectivity information characterizing the multi-layer network. The claim further specifies that the inter-domain configuration manager comprises an inter-domain tree manager, with the inter-domain tree manager comprising a logical tree manager. The logical tree manager is operative to manage a transport service and facility hierarchy associated with the multi-layer network, and to maintain corresponding parent-child relationships in one or more tree structures that reference the domains containing real-time network details associated with the transport service and facility hierarchy.

The Examiner in formulating the §103(a) rejection of claim 1 acknowledges that the Mortensen reference fails to teach or suggest an inter-domain tree manager comprising a logical tree manager as claimed, but argues that these missing teachings are provided by Weber. Applicants respectfully disagree.

The Examiner specifically relies on the teachings of Weber in FIGS. 2 and 3, the abstract, column 4, lines 4-16, and column 5, lines 43-51. However, these particular portions of Weber fail to meet the limitation in question. For example, column 4, lines 4-16, of Weber provides as follows:

FIG. 2 illustrates a conceptual architecture of a multi-layer service management topology in accordance with a preferred embodiment of the present invention. The architecture for the system of the present invention is a traditional hierarchy of configurable items (CI's) with their associated interfaces. The architecture desirably is designed to support a hierarchical business structure wherein a primary core network is managed by a central global network operator and a number of distributors. In a preferred embodiment, a system management domain (SMD) 210, which desirably is under the control of a global network operator, is associated with core network 230, which desirably provides global connectivity.

The column 5, lines 43-51, portion of Weber provides as follows:

System 100 (FIG. 1) provides two fundamental core services: connectivity, or allowing a connection to be made between two or more points; and information transportation, or the ability to transport information over a connection. These fundamental system network services are provided through core network 230 (FIG. 2) and are managed through NOCC 310. Core services 325, such as system and backbone connectivity and transport services managed by NOCC 310 are managed through Network Service Manager 315, which includes hardware and software adapted to provide and manage the core services at the core network level. Transport services are provided via core network 230 (FIG. 2), which desirably is comprised of a plurality of satellites, such that data is transported from point-to-point, from point-to-multiple points, from multiple points-to-point, and/or from multiple points-to-multiple points. Service elements for providing such services, including for example, management information and services information, reside within services data base 320. In a preferred embodiment, core services 325 include services that are provided to distributors so that the distributors can operate individual DVNSs 240 (FIG. 2).

Applicants respectfully submit that the relied-upon portions of Weber fail to teach or suggest an inter-domain tree manager comprising a logical tree manager, with the logical tree manager being

operative to manage a transport service and facility hierarchy associated with a multi-layer network, and to maintain corresponding parent-child relationships in one or more tree structures that reference domains containing real-time network details associated with the transport service and facility hierarchy, as recited in claim 1.

Apparently, the Examiner argues that because Weber states generally that the system architecture is a "traditional hierarchy of configurable items," it necessarily meets the claim limitations at issue. However, the above-quoted passages indicate that "[c]ore services 325, such as system and backbone connectivity and transport services managed by NOCC 310 are managed through Network Service Manager 315." If this Network Service Manager 315 of FIG. 3 is alleged to correspond to the claimed inter-domain configuration manager, there is no suggestion in Weber that it comprises an inter-domain tree manager having a logical tree manager which maintains tree structures that reference the domains. To the contrary, the system architecture as shown in FIGS. 2 and 3 of Weber apparently comprises only a core network level and a distributed virtual network segment (DVNS) level. See, for example, column 4, lines 9-12. As a result, there seems to be no need for a logical tree manager or associated tree structures in the Network Services Manager 315 of FIG. 3. This is because there is only the DVNS level under the core network level in the management structure of Weber, as shown in FIG. 2, and not any additional levels that are described as being centrally managed using tree structures as claimed. In other words, since there is only a single system level being managed in Weber, the tree-related features of the claim are not needed in Weber, and are not disclosed or suggested in Weber.

Similarly, if the System Management Domain (SMD) 210 of FIG. 2 is alleged to correspond to the claimed inter-domain configuration manager, there is no suggestion in Weber that it comprises an inter-domain tree manager having a logical tree manager which maintains tree structures that reference the domains. To the contrary, Weber indicates that the SMD 210 manages a single additional level, namely, the local management domains (LMDs) 220.

Thus, it appears that the Examiner is relying on the two-level architecture of FIGS. 2 and 3 as allegedly showing the tree structure limitations at issue, when Weber specifically indicates that the inter-domain management elements provided at the core network level manage only a single additional level. Since there is only a single level that is managed, there is no need for tree structures

of the type claimed. Accordingly, Applicants respectfully submit that elements such as SMD 210 of FIG. 2 and Network Service Manager 315 of FIG. 3 cannot comprise an inter-domain configuration manager which includes an inter-domain tree manager and logical tree manager utilizing tree structures as claimed.

Claim 1 thus includes one or more limitations which are not taught or suggested by the proposed combination of Mortensen and Weber. The combined teachings of these references therefore fail to "teach or suggest all the claim limitations" as would be required by a proper §103(a) rejection.

Also, as indicated previously, the Examiner has failed to identify a cogent motivation for combining the references or for modifying the reference teachings to reach the claimed invention. On this point, the Examiner provides the following statement at page 3, last full paragraph, of the Final Office Action, with emphasis supplied:

> At the time the invention was made, one of ordinary skill in the art would have been motivated to employ an inter-domain tree manager in order to provide hierarchical structure between the domains, therefore allowing quick retrieval of information associated with the network.

The Federal Circuit has stated that when patentability turns on the question of obviousness, the obviousness determination "must be based on objective evidence of record" and that "this precedent has been reinforced in myriad decisions, and cannot be dispensed with." In re Sang-Su Lee, 277 F.3d 1338, 1343 (Fed. Cir. 2002). Moreover, the Federal Circuit has stated that "conclusory statements" by an examiner fail to adequately address the factual question of motivation, which is material to patentability and cannot be resolved "on subjective belief and unknown authority." Id. at 1343-1344. There has been no showing in the present §103(a) rejection of objective evidence of record that would motivate one skilled in the art to combine Mortensen and Weber, or to modify the proposed combination, to produce the particular limitations in question. The above-quoted statement of obviousness given by the Examiner in the Final Office Action is precisely the type of subjective, conclusory statement that the Federal circuit has indicated provides insufficient

support for an obviousness rejection. It therefore appears that the combination proffered by the Examiner is based primarily upon impermissible hindsight, given the benefit of the disclosure provided by Applicants, rather than upon any objective evidence of record.

Further, even if it is assumed that a proper *prima facie* case has been established, there are particular teachings in one or more of the references which controvert the obviousness argument put forth by the Examiner. For example, each of the two references provides a distinct approach to network management. There is no indication that these two distinct approaches are combinable into a single workable implementation in the manner alleged by the Examiner. To the contrary, the references themselves suggest that the proposed combination would likely be unworkable. See, for example, the Mortensen reference at page 7, middle of the page, wherein it is stated that a single network service manager approach, similar to that shown in FIGS. 2 and 3 of Weber, can be "close to impossible to implement . . . in the case of a large network." Such teachings argue against the proposed combination, and teach away from the claimed invention.

Also, Weber specifically indicates, at column 5, lines 14-22, that the various service provider entities of the distributed virtual network segment level operate independently of one another:

> The architecture described with reference to FIG. 2 supports the multilayer system management system described with reference to FIG. 3 below to enable individual service providers to control their network services independently from other service providers. Thus, from the service provider's perspective, the system appears to be a virtual network for which the service provider can control system functions such as security, subscriber access, routing, addressing, and offered services.

This is believed to be an explicit teaching away from the claimed invention, and the proposed combination of Weber with Mortensen.

Applicants therefore respectfully submit that independent claim 1 is allowable over Mortensen and Weber.

Dependent claims 2-7 and 11-17 are believed allowable for at least the reasons identified above with regard to independent claim 1.

Independent claims 18 and 19 include limitations similar to those of claim 1, and are believed allowable for substantially the same reasons identified above with regard to claim 1.

Claim 8

With regard to claim 8, this claim specifies that the inter-domain tree manager maintains an end-to-end view of planned and provisioned transport services and facilities for the multi-layer network. The Examiner argues that the collective teachings of Mortensen and Weber meet this limitation, relying particularly on FIG. 2 and column 4, lines 4-16, of Weber. However, Weber at column 4, lines 35-48, clearly indicates that each service provider operating within an LMD 220 "is responsible for managing and operating its DVNS, including the resources, subscribers and services." Thus, there is apparently no inter-domain tree manager in the proposed combination that maintains an end-to-end view of planned and provisioned transport services and facilities. Accordingly, the proposed combination of Mortensen and Weber fails to meet the particular limitation in question.

Claim 9

With regard to claim 9, this claim specifies that the inter-domain tree manager further comprises, in addition to the logical tree manager, a view manager and a connectivity database for storing the connectivity information characterizing the multi-layer network. The Examiner acknowledges that such an arrangement is not shown in Mortensen, but argues that the limitation is met by the teachings in FIG. 2 and column 4, lines 4-16, of Weber. However, the relied-upon portion of Weber fails to teach or suggest an inter-domain tree manager having the particular set of elements required by the claim. Applicants therefore believe that the limitation is not met by the proposed combination of Mortensen and Weber.

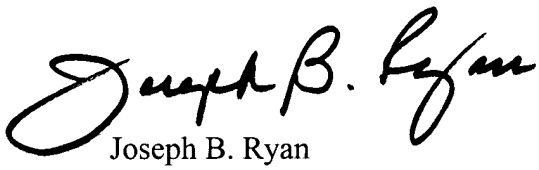
Claim 10

With regard to claim 10, this claim specifies that the logical tree manager manages an end-to-end transport service and facility hierarchy, and maintains corresponding parent-child relationships in one or more tree structures that reference the domains containing real-time network details

associated with the end-to-end transport service and facility hierarchy. The Examiner once again relies on the teachings in FIG. 2 and column 4, lines 4-16, of Weber. However, the use of tree structures to characterize an end-to-end transport service and facility hierarchy is not disclosed in the relied-upon portions of Weber. Thus, Applicants believe that the proposed combination of Mortensen and Weber fails to meet the limitation in question. In fact, the distributed management arrangement of Weber is believed to directly teach away from such a limitation.

In view of the above, Applicants believe that claims 1-19 are in condition for allowance, and respectfully request the withdrawal of the §103(a) rejection.

Respectfully submitted,



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CLAIMS APPENDIX

1. A network management system comprising:

an inter-domain configuration manager arranged between a set of one or more network service management applications and a plurality of network element domain managers, each of the domain managers being associated with a particular architectural or technological domain of a multi-layer network, the configuration manager implementing network service design and provisioning functions across a plurality of the domains of the network in conjunction with stored connectivity information characterizing the multi-layer network;

wherein the inter-domain configuration manager further comprises an inter-domain tree manager, the inter-domain tree manager comprising a logical tree manager operative to manage a transport service and facility hierarchy associated with the multi-layer network, and to maintain corresponding parent-child relationships in one or more tree structures that reference the domains containing real-time network details associated with the transport service and facility hierarchy.

2. The system of claim 1 wherein the inter-domain configuration manager is interfaced to at least one of the set of network service management applications and the plurality of network element domain managers through a published Common Object Request Broker Architecture (CORBA) Application Programming Interface (API).

3. The system of claim 1 wherein the set of one or more network service management applications comprise one or more of an order manager, a trouble manager, a billing manager, a customer service manager, and a service level reporter.

4. The system of claim 1 wherein the domains of the multi-layer network comprise one or more of a circuit-switched domain, an Internet Protocol (IP) domain, an Asynchronous Transfer Mode (ATM domain, a Frame Relay (FR) domain, a Synchronous Digital Hierarchy (SDH) domain, a Synchronous Optical Network (SONET) domain, and an optical domain.

5. The system of claim 1 wherein the inter-domain configuration manager provides single-point access to provisioning functions in a manner which is independent of the corresponding domains.

6. The system of claim 1 wherein the inter-domain configuration manager provides single-point access to end-to-end views of services and their underlying infrastructure, down to a physical layer of the multi-layer network, in a manner which is independent of the corresponding domains.

7. The system of claim 1 wherein the inter-domain configuration manager further comprises an inter-domain provisioning manager.

8. The system of claim 1 wherein the inter-domain tree manager maintains an end-to-end view of planned and provisioned transport services and facilities for the multi-layer network.

9. The system of claim 1 wherein the inter-domain tree manager further comprises a view manager, and a connectivity database for storing the connectivity information characterizing the multi-layer network.

10. The system of claim 1 wherein the logical tree manager manages an end-to-end transport service and facility hierarchy, and maintains corresponding parent-child relationships in one or more tree structures that reference the domains containing real-time network details associated with the end-to-end transport service and facility hierarchy.

11. The system of claim 9 wherein the view manager provides a plurality of different presentations of the network connectivity information, and provides a particular presentation associated with a tree structure stored by the logical tree manager upon receipt of a request for such a presentation.

12. The system of claim 7 wherein the inter-domain provisioning manager provides provisioning of services and facilities across the multiple domains.

13. The system of claim 7 wherein the inter-domain provisioning manager comprises an end-to-end design manager and an implementation manager.

14. The system of claim 13 wherein the end-to-end design manager provides network service design capabilities across the plurality of domains, utilizing a set of design rules for inter-domain connectivity, and coordinates designs among the domains in the particular inter-domain path.

15. The system of claim 13 wherein the implementation manager coordinates the implementation of an end-to-end network service design across the plurality of domains.

16. The system of claim 1 further comprising an inter-domain fault manager associated with the inter-domain configuration manager and arranged between at least a subset of the network service management applications and at least a subset of the plurality of network element domain managers, the inter-domain fault manager providing fault management functions across the plurality of domains of the network.

17. The system of claim 1 further comprising an inter-domain capacity manager associated with the inter-domain configuration manager and arranged between at least a subset of the network service management applications and at least a subset of the plurality of network element domain managers, the inter-domain capacity manager providing management of transport capacity across the multi-layer network.

18. A method of implementing a network management system, the method comprising the steps of:

providing an inter-domain configuration manager arranged between a set of one or more network service management applications and a plurality of network element domain managers, each of the domain managers being associated with a particular architectural or technological domain of a multi-layer network; and

utilizing the inter-domain configuration manager to implement network service design and provisioning functions across a plurality of the domains of the network in conjunction with stored connectivity information characterizing the multi-layer network;

wherein the inter-domain configuration manager further comprises an inter-domain tree manager, the inter-domain tree manager comprising a logical tree manager operative to manage

a transport service and facility hierarchy associated with the multi-layer network, and to maintain corresponding parent-child relationships in one or more tree structures that reference the domains containing real-time network details associated with the transport service and facility hierarchy.

19. A machine-readable medium storing one or more software programs for use in implementing a network management system, the one or more software programs when executed providing an inter-domain configuration manager arranged so as to interface with a set of one or more network service management applications and a plurality of network element domain managers, each of the domain managers being associated with a particular architectural or technological domain of a multi-layer network, the inter-domain configuration manager implementing network service design and provisioning functions across a plurality of the domains of the network in conjunction with stored connectivity information characterizing the multi-layer network;

wherein the inter-domain configuration manager further comprises an inter-domain tree manager, the inter-domain tree manager comprising a logical tree manager operative to manage a transport service and facility hierarchy associated with the multi-layer network, and to maintain corresponding parent-child relationships in one or more tree structures that reference the domains containing real-time network details associated with the transport service and facility hierarchy.

EVIDENCE APPENDIX

None

RELATED PROCEEDINGS APPENDIX

None